

R E M A R K S

By this Amendment the specification has been amended to include topic headings and provide proper antecedent for the recitations in claims 25-27, 30, 31-33, 35 and 43, claims 21 and 34 have been revised to better define the invention, and claims 22-33 and 35-37 have been amended regarding their introductory wording.

With respect to the revisions of claim 21, the phrase "non-polar liquid other than a fuel" has been replaced by the phrase "non polar liquid other than a petroleum derivative paraffin or a liquid halogenated hydrocarbon." The basis for this amendment can be found at page 1, third paragraph of the specification, where it is noted that the prior art discloses a method for the preparation of biliquid foam compositions which may comprise the non-polar liquid in an amount of about 60% to about 98% by volume, the hydrogen bonded liquid constituting the balance. The polar liquid may comprise a petroleum derivative, paraffin or a liquid halogenated hydrocarbon. The biliquid foam composition prepared comprises 96% by volume methanol and 4% by volume water, the composition having a limited stability of only several days. It would be clear to a person of ordinary skill in this art, having regard to the specification as a whole, that the term "other than a fuel" was used to distinguish the present invention from that of Sebba. Accordingly, it is clear that the meaning of "other than a fuel" means "other than a petroleum derivative, paraffin or a liquid halogenated hydrocarbon."

The examiner will find attached hereto a supplemental page 31 for this application containing an abstract of the disclosure.

In the outstanding Office Action the examiner has rejected claims 21-33 under 35 U.S.C. 103(a) as being obvious over Guffogg et al.

The applicants assert that this rejection is incorrect.

Guffogg et al. disclose the preparation of a biliquid foam. Example 1 describes a biliquid foam having an oil phase of 89.10% w/w mineral oil, C₁₂-C₁₃ Pareth-3 and an aqueous phase of 9.8% w/w demineralized water, 0.1% sodium Lauryl ether sulphate (2EO) and 0.1% preservative.

Example 2 describes a biliquid foam having an oil phase of 80% w/w diesel fuel and an aqueous phase of 13.3% w/w water, 5.7% w/w demineralized water and 1% w/w Croduret 50 (a hydrogenated castor oil/polyethylene glycol adduct wherein 50 refers to the number of ethylene groups).

Example 4 describes a biliquid foam having an oil phase of 80% w/w diesel fuel and an aqueous phase of 19% w/w methanol/water (96%/4% mixture) and 1% w/w Croduret 50.

Etocas 25 (a castor oil/polyethylene glycol adduct wherein 25 refers to the number of ethylene oxide in the polyethylene oxide chain) is disclosed as a surfactant in Example 9 in combination with the oil phase being 89.10% w/w fragrance, Oleth-10 0.45%w/w, and an aqueous phase of 9.8% w/w demineralized water, 0.1% w/w polysorbate 20 and 0.1% w/w preservative.

As the examiner notes, there is no disclosure in Guffogg et al. of a biliqid foam comprising the specific components of the polar phase, non polar phase and surfactant as defined in applicants' claim 21.

Guffogg et al. disclose that, when the non-polar phase of the biliqid foam is a petroleum derivative, the polar phase will generally comprise from 50% to 99% w/w of C₁ to C₄ alcohol or ethylene glycol, or mixtures thereof (page 6, lines 22 to 25). Examples 2 and 4 of the specification support this. There is however no suggestion in Guffogg et al. of a biliqid foam comprising a polar phase other than a petroleum derivative, paraffin or a liquid halogenated hydrocarbon with a high level of C₁ to C₄ alcohol or ethylene glycol, or mixtures thereof. The teaching of Guffogg et al. is limited only to high levels of C₁ to C₄ alcohol or ethylene glycol, or mixtures thereof being present in the polar phase when the non-polar phase comprises a petroleum derivative. It is therefore submitted that contrary to the examiner's suggestion that a person of ordinary skill would not adapt the teaching of Guffogg et al. to arrive at the present invention, Guffogg et al. lead the person of ordinary skill away from the present invention.

Moreover, even if a person of ordinary skill did consider making a biliqid foam including a non polar liquid other than a petroleum derivative, paraffin or a liquid halogenated hydrocarbon and from 2 to 88% by weight of a continuous phase polar liquid comprising a C₁-C₄ alcohol, a liquid polyethylene glycol, ethylene glycol or propylene glycol, or mixtures thereof, in an amount of at least 65% by weight, relative to

the weight of the continuous phase, the present inventors have found that in order for the biliquid foams to be stable, it is necessary to use only specific surfactants. In particular, the surfactant must be selected from castor oil/poly(alkylene glycol) adducts containing from 20 to 50 alkoxy groups, a C₈-C₂₄ fatty acid or hydrogenated castor oil/poly(alkylene glycol) adducts containing from 20 to 60 alkoxy groups, or mixtures thereof.

The examiner has suggested that if a person of ordinary skill replaced the non-polar phases of Examples 2 and 4 with other non-polar phases, for example mineral oils or emollient esters, the person of ordinary skill would arrive at the present invention. It is however submitted that one of ordinary skill in the art would not have had a reasonable expectation of success that it would be possible to form stable biliquid foams having high levels of a C₁-C₄ alcohol, a liquid polyethylene glycol, ethylene glycol or propylene glycol, or mixtures thereof without the presence of a petroleum derivative. There is no suggestion of such compositions in Guffogg et al. Moreover, it is well known in the art that conventional emulsions containing high levels of alcohols are unstable (see page 2 of the present invention). Indeed, the present inventors have found that in order to form stable biliquid foams with high levels of alcohol only specific surfactants may be used. Accordingly, it would not be obvious to arrive at the present invention in the light of Guffogg et al.

The prior art rejection of claims 21-33 based on Guffogg et al. should be withdrawn.

The examiner has rejected claims 21-25 and 28-31 under 35 U.S.C. 103(a) as being unpatentable over Sebba in view of Flick, and claims 26, 27 and 32-37 under 35 U.S.C. 103(a) as being unpatentable over Sebba in view of Flick, Wheeler and Curry et al.

These rejections are also incorrect.

Sebba discloses that the preparation of biliquid foams. It states that the hydrogen bonded liquid may be alcohols and glycols (column 4, lines 20 to 25). The non polar liquid may be animal and vegetable oils, petroleum derivatives, paraffins and liquid halogenated hydrocarbons (column 4, lines 46 to 49). It further teaches that the surfactants may be for example polyethylene oxide derives surfactants (see column 4, lines 28 to 40).

The examiner has then referred to Flick, which discloses, for example PEG-40 Castor Oil (which falls with the scope of the list of surfactants recited in claim 21 of the present application) and stated that these surfactants have excellent stability and lubricity. The examiner therefore suggests that one of ordinary skill in the art would have had a reasonable expectation of success in using the surfactants of Flick in the compositions of Sebba because the surfactants fall within the class of surfactants described as acceptable by Sebba, and that he would have been motivated to do so because of the advantageous stability and lubricity.

The applicant respectfully disagrees with the examiner for the following reasons.

Firstly, Sebba teaches that the hydrogen bonded liquid of the polyaphron dispersion must contain a soluble surfactant (see column 4, line 26). Suitable examples of such surfactants are polyethylene oxide derived surfactants, alkali metal alkyl-benzene sulphonates and quaternary ammonium surfactants. The sodium salt of dodecylbenzene sulphonate is particularly preferred. There is no suggestion of the specific surfactants required by the present invention. Sebba goes on to teach that the non-polar liquid generally contains a small but effective quantity of soluble surfactant (see column 4, lines 50 to 54). Although an additional surfactant is not required when the non-polar solvent has a spreading capability on its own, for example, kerosene and other impure oils, where a surfactant is required in the non-polar liquid to render the latter spreadable on the hydrogen bonded liquid, suitable surfactants for this purpose are non-ionic liquid surfactants such as oil-soluble polyethyleneglycol ethers, and fatty acids (see column 4, lines 62 to 68).

Thus, there is no suggestion in Sebba that it is possible to provide a stable polyaphron dispersion wherein the surfactant(s) consists (i.e., to the exclusion of all other surfactants) of one or more of castor oil/poly(alkylene glycol) adducts containing from 20 to 50 alkoxy groups and hydrogenated castor oil/poly(alkylene glycol) adducts containing 20 to 60 alkoxy groups, as required by the present invention.

It would also not be obvious to arrive at the present invention in the light of Flick.

Firstly, Flick discloses a large number of surfactants. There is no disclosure in Flick of biliquid foams. Instead this document refers to emulsifiers. As outlined in Sebba, polyaphron dispersions are very different from emulsions. It is therefore not obvious why one skilled in the art would go to a reference on Emulsifying agents: an Industrial perspective. There is no reference in Flick to polyaphrons or to polyaphrons high in alcohol. This book contains over 1500 emulsifying agents and it is submitted that, contrary to the examiner's suggestion, one of ordinary skill in the art would not have had a reasonable expectation of success in using the surfactants of Flick in the compositions of Sebba, and that he would not have been motivated to do so because of the advantageous stability and lubricity for the reasons outlined below. Furthermore, even if he did, he would not arrive at the present invention.

The examiner states that the SURFACTOLS surfactants referred to in Flick have excellent stability and lubricity. However, the SURFACTOLS at page 61 of Flick are taught to have "excellent stability over a broad pH". The stability that this refers to is chemical stability, and not emulsion stability. This is supported by the fact that on page 56, Flick refers to another surfactant (AMP-95) which is stated as having "superior emulsions stability". It is therefore submitted that one of ordinary skill in the art would be taught towards using AMP-95, and not SURFACTOLS if they considered the teaching of Flick when considering emulsion stability. Thus, Flick does not motivate a person of ordinary skill to have had a reasonable expectation of success in using the SURFACTOLS surfactants

of Flick in the compositions of Sebba because of the advantageous stability.

Furthermore, and as outlined above, the Sebba patent teaches that the hydrogen bonded liquid must contain a soluble surfactant (see column 4, line 26). Sebba teaches that "in general it has been found that any water soluble surfactant that would produce a good foam will produce a stable polyaphron" (see column 4, lines 37 to 40). However, Flick states that Surfactol non-ionic surfactants are "low foaming" (see page 61). It would therefore go against the teaching of these two documents to combine them.

Moreover, as mentioned above Sebba recites that "suitable surfactants for this purpose are non-ionic liquid surfactants such as oil soluble polyethyleneglycol ethers, and fatty acids" in the context of additional surfactants for the non-polar solvent (see column 5, lines 1 to 2). However, TAGAT R40 (disclosed on page 92 of Flick) is a solid. Moreover, PEG-40 Castor Oil (disclosed on page 61 of Flick) is not a liquid, instead it is pasty and turbid. Thus, again the person of ordinary skill in the art would need to go against the teaching of Sebba to combine it with page 61 and page 92 of Flick.

In view of the above it is submitted that it would not be obvious to combine Sebba and Flick to suggest the claimed invention. And nothing in Wheeler or Curry et al. would overcome this deficiency.

The examiner has rejected claims 21-37 on the ground of non-statutory obviousness-type double patenting over claims 1-7 of Wheeler in view of Flick and Curry et al.

However, referring to the arguments regarding Flick and Curry et al. above, this rejection should also be withdrawn.

Respectfully submitted,

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ANGUS CHEMICAL CO.: Emulsifying Agents:

AMP-95:

AMP-95 (2-amino-2-methyl-1-propanol containing 5% water), when used in combination with fatty acids or nonionic surfactants, is a highly-effective emulsifying agent for emulsifiable waxes in aqueous systems. Emulsions of these waxes are used to impart outstanding physical properties to finished formulations of such diverse products as floor polishes, buffering compounds, drawing compounds, and textile lubricants.

When used in emulsions, AMP-95 provides a number of benefits:

- Superior emulsion stability.
- Light-colored emulsions.
- Increased emulsion transparency.
- Ready emulsification of a wide variety of waxes.
- Excellent gloss and leveling of films.
- Minimal fire hazard.
- Ease of handling.

In addition, AMP-95 can be used to advantage in specific situations because of its high boiling point and excellent emulsification efficiency.

DMAMP-80:

80% 2-Dimethylamino-2-methyl-1-propanol solution

2-Dimethylamino-2-methyl-1-propanol, is the tertiary-amine homolog of 2-amino-2-methyl-1-propanol(AMP). 2-Dimethylamino-2-methyl-1-propanol is commercially available as DMAMP-80 which contains 20% by weight water.

Typical Properties:

Neutral equivalent: 148
 Specific Gravity at 25/25C: 0.95
 Weight per gallon at 25C: 7.9 lb
 Flash point, Tag open cup: 150F
 Tag closed cup: 153F
 Freezing point: -20C
 Boiling point at 760 mmHg: ~98C
 Viscosity at 25C, Gardner: A-A2
 pH of 0.1N aqueous solution: 11.6

Emulsifying Agent:

DMAMP-80 in combination with an unsaturated fatty acid (e.g., oleic acid or tall oil fatty acids) is extremely effective in producing emulsions of waxes.

Corrosion Inhibition
 Resin Solubilization
 Catalyst
 Additive